



# **Green Building Standards With a Rehabilitation Emphasis**

**Community Revitalization Fund (CRV)  
Neighborhood Stabilization Fund (NSP)**

**June 8, 2010**



# **Single Family Green Building Standards For Rehabilitation Training**

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**Tuesday, June 8, 2010 10:00 AM to Noon CDT**

## **-Welcome-**

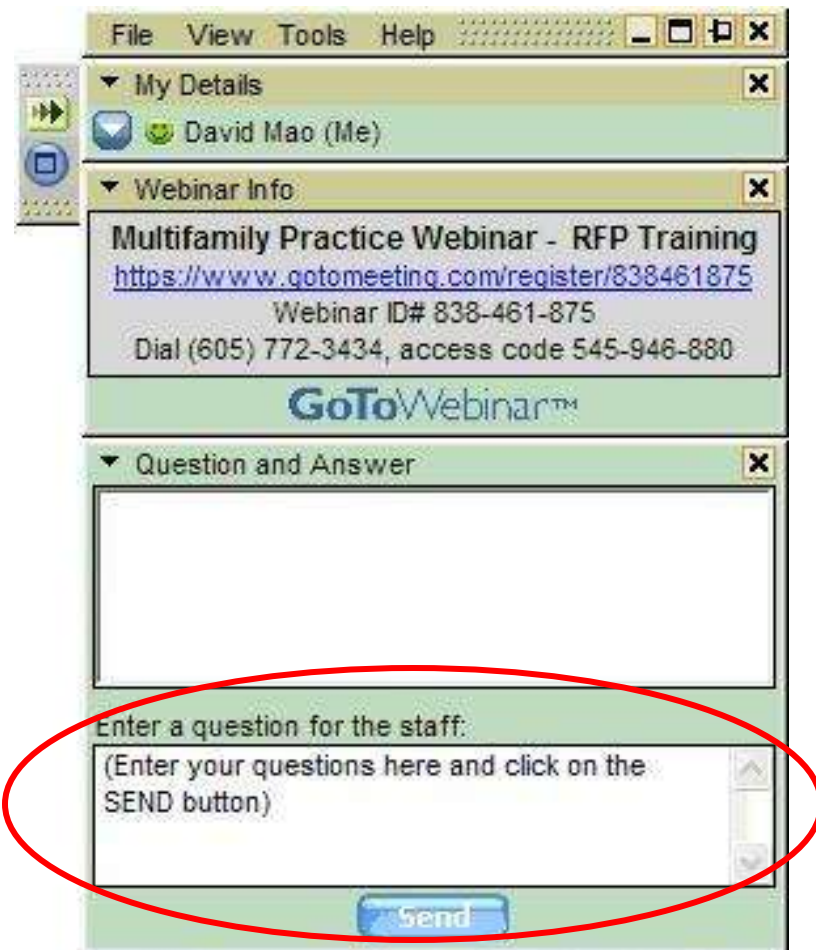
**The presentation will begin at 10:05 AM CDT to allow for registrants to log into the system. When you join the presentation, you will hear background music. Please stay on the line.**

**To join the conference call:**

**Dial: 1-877.241.4296 - Access Code: 17128941#**

- If you are having difficulty joining, please e-mail:  
stacy.bray@state.mn.us**

# Questions During Presentation



- We will batch online questions and answer them throughout the webinar
- A complete Q & A list will be posted to the Minnesota Housing website when training is completed
- All presentation materials from Minnesota Housing are posted on our website at [www.mnhousing.gov](http://www.mnhousing.gov)

# Next Speaker

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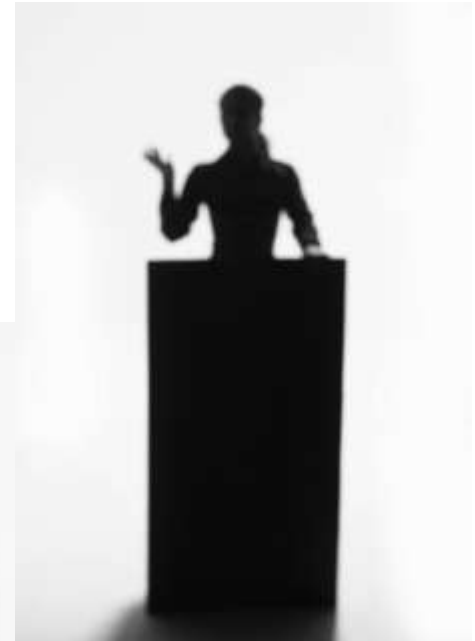



- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**

# Today's Speakers

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- **Minnesota Housing**
  - » **Devon Pohlman**
  - » **Carol Dixon**
- **Minnesota Department of Health**
  - » **Andrew Gilbert**
- **Greater Minnesota Housing Fund**
  - » **John Harrington**



A photograph of two young Black girls on a staircase. The girl in the background is wearing a white t-shirt and has her arms around the girl in front. The girl in the foreground is wearing a red shirt with a small American flag patch. Both girls are smiling and looking towards the camera. The background shows a white wall and a metal handrail.

Minnesota Housing finances  
and advances affordable housing  
opportunities for low and moderate  
income Minnesotans to  
enhance quality of life and foster  
strong communities.

End long-term homelessness.

Finance new affordable housing opportunities.

Increase emerging market homeownership.

Preserve affordable housing.

# **Training Agenda**

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- **Background**
- **Policy Overview**
  - » **Minnesota Housing's Sustainability Policy**
    - **CRV green requirements**
    - **NSP green requirements**
- **Process Overview**
- **The Criteria in Detail**
- **Tools & Resources**



# **Sustainability Policy**

## **Minnesota Housing**

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- **Adopted February, 2007**
- **Encourage sustainable, healthy housing**
  - » **Optimize use of cost effective, durable materials & systems**
  - » **Minimize consumption of natural resources during construction/rehab & maintenance and operation**

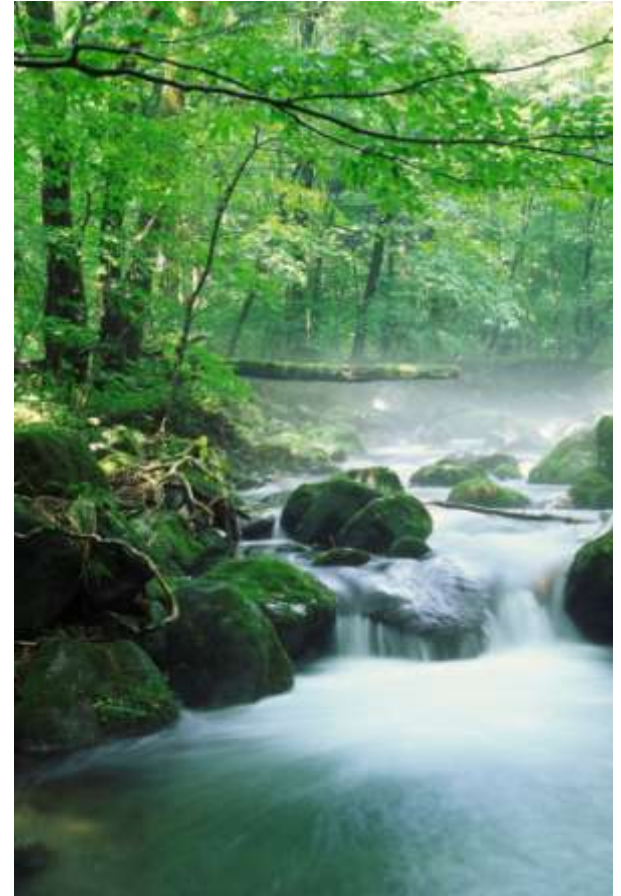


# **Sustainability Policy**

## **Minnesota Housing**

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- **Encourage use of renewable energy & resources**
  - » **Minimize damages and impact to the environment**
  - » **Maximize use of natural amenities of the development site**



# Selecting a Green Standard

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- **Choosing a system that matches Minnesota climate**
- **Selecting a system that reflects the diversity of scale & locations of Minnesota Housing projects**
- **Flexible for both new construction and rehabilitation**
- **Variety of green building programs**
  - » **LEED**
  - » **Energy Star**
  - » **Minnesota GreenStar (MN-specific)**
  - » **Enterprise Green Communities**

# Opportunity & Match

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- **Enterprise Green Communities**
  - » **National Green Communities Criteria**
  - » **Developed through Enterprise Community Partners**
  - » **Specific to the affordable housing sector**
  - » **Basis for Minnesota Green Communities partnership**

**[www.greencommunitiesonline.org](http://www.greencommunitiesonline.org)**

# Minnesota Green Communities

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- **Collaboration of Greater Minnesota Housing Fund, Family Housing Fund, & Enterprise**
- **Consults with Minnesota Housing in development of the Minnesota Overlay**
- **Hosts trainings and conferences, & provides technical assistance**

**[www.mngreencommunities.org](http://www.mngreencommunities.org)**



# **National Green Communities**

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- **For new construction & rehabilitation**
- **For Single Family & Multifamily**
- **Has mandatory and optional requirements**
- **Minnesota Housing adopted ONLY the mandatory criteria**
- **Updated & reviewed by MN Green Communities & Minnesota Housing**



# Minnesota Housing and Green Communities

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- **Applies to the following programs & activities:**
  - » **CRV New Construction & Acquisition /Rehab /Resale**
  - » **Rehabilitation Loan Program**
  - » **Numerous Multifamily programs**
  - » **NSP (policy is modified under this program)**



# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Carol Dixon**
  - » **Minnesota Housing Community Development**



# **NSP Housing Improvement Standards**

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- **Federal requirements for lead and asbestos abatement**
- **When different codes or standards govern the same condition, use highest or most restrictive**
- **HUD Healthy Homes – incorporate seven steps as guidance for standards followed**

# **NSP Housing Improvement Standards**

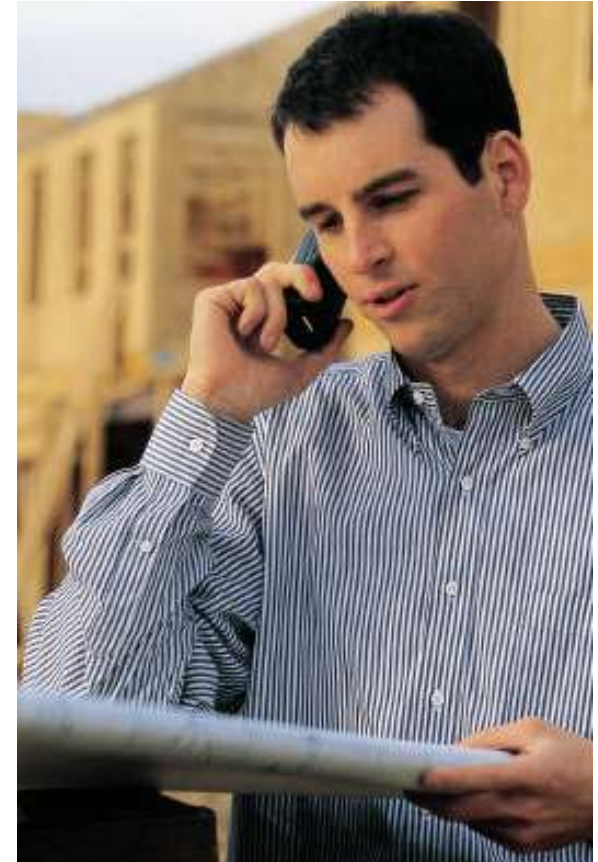
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- **NSP New Construction complies with 2009-2010 Minnesota Overlay including selecting Energy Star qualified products**
- **Multifamily should consider Minnesota Housing Multifamily Design Standards**
- **NSP rehabilitation standards modify Minnesota Green Overlay**

# **NSP - Housing Improvement New Construction Standards**

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- **Housing built in accordance with State Building, Electrical, and Plumbing Codes**
- **Minnesota Housing Green Overlay for NSP**
  - » **Application of relevant 2009-2010 Green Communities Criteria with the Minnesota Overlay to any new construction housing development financed with NSP funds for an eligible NSP activity**
  - » **Multifamily housing should consider Minnesota Housing Multifamily Design Standards**



# **NSP - Housing Improvement**

## **New Construction Standards**

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- **Demolition Activities**
  - » **Federal requirements for lead and asbestos abatement during demolition**
  - » **Consider deconstruction practices when crews available and market exists**
  - » **Stabilize soil on site if lead present and property not redeveloped within three months of demolition**

# **NSP Rehabilitation Standards**

## **Modifications/exceptions to MN Overlay**

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- **Initial property assessment of structure for mold or water infiltration and major component life expectancy**
- **Rehabilitation standards apply to systems “touched” during rehabilitation**
- **Mandatory criteria in Sections 1-8 are optional unless improvements “touched” by rehabilitation**
  - » **“Touched” – when system or component is altered or replaced during rehabilitation**

# **Optional Green Criteria**

## **Additional guidance for NSP rehabilitation**

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- **Further modifications/exceptions**
- **These standards do not apply for rehab:**
  - » **3-1 Environmental Remediation**
  - » **7-10b Basements and concrete slabs, Radon**
  - » **8-1, 8-2, 8-3 Building maintenance and occupant's manual, orientation**
- **Section 5-1b (efficient energy use, rehabilitation)**
  - » **Use 5-1a and use current Energy Star Builder's Option Package (BOP) for any equipment/component replaced – no field verification or testing required**

# **NSP - Housing Improvement Rehabilitation Standards**

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- **Minnesota Housing Green Community Overlay is modified for NSP rehabilitation activities**
  - » **Property in compliance with local housing standards**
  - » **If local housing standards do not exist, the housing must meet the minimum housing quality standards (HQS) of 24 CFR 982.401.**
    - **Mitigate Mold or water infiltration if observed in assessment**
    - **Installation of smoke detectors, carbon monoxide detection equipment, and GFCI receptacle**
    - **Application of relevant 2009-2010 Green Communities Criteria with the Minnesota Overlay to any building component that is modified or altered during a financed activity; including selecting Energy Star qualified products**

# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**



# Green Communities

## Areas of Focus

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1. Integrated design plan
2. Location and neighborhood fabric
3. Site improvements
4. Water conservation
5. Energy efficiency
6. Materials beneficial to the environment
7. Healthy living environment
8. Operations & Maintenance



# Minnesota Overlay

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- **Minnesota Housing-specific**
- **Supplements national criteria**
- **Modifies six of the eight broad categories**
- **Provides greater flexibility**
- **Many criteria only need addressing if the rehabilitation “touches” the item in question per the scope of work**

# Additional Program-Specific Requirements

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- **State building code and local ordinances**
  - » **Community Revitalization Fund**
    - **Housing Quality Standards**
  - » **NSP**
    - **Follow Federal requirements for lead, asbestos and NSP Housing Standards**
    - **Green Communities Overlay as modified**

# Q & A

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- **We will take time here to answer a few questions**



# Process Overview

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- **Intended Methods form**
- **Waiver policy and process**
- **Project close-out and evaluation**

# Intended Methods Form

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- Functions as a green development planning tool
- Used to document intent to comply on front end & to document compliance after rehab
- For CRV, sign Section 9 upfront & Section 11 at completion of construction
- For NSP, complete intended methods form for each property following CRV before and after NSP activity



# Intended Methods Form

## Submission to Minnesota Housing

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- **One form required**
  - » **For CRV--submit at RFP application**
  - » **For NSP – execute and retain in property-specific files relating to new construction or rehabilitation**





# Intended Methods Reference Sheet



**Minnesota Housing**  
Finance Agency

**Method of Satisfying  
Green Communities Criteria  
and Certification**



**MINNESOTA  
green  
communities**

Development Name: \_\_\_\_\_

Please identify current development stage: ☐ Initial Application ☐ Loan Commitment/Closing **(MF Only)** ☐ End of Construction

ITEM	TITLE	METHOD OF SATISFYING GREEN CRITERIA	YES	NO	WATERS REQUIRED
<b>Section 1: Integrated Design</b>					
1.1	Green Development Plan <b>(Mandatory)</b>	The national criterion is modified by the Minnesota Overlay so that the Green Development Plan requirement is covered by completing this form prior to & after construction.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Section 2: Site, Location and Neighborhood Fabric</b>					
2.1a	Smart Site Location - Proximity to Existing Development: New Construction <b>(Mandatory)</b>	New Construction only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.1b	Smart Site Location - Protecting Environmental Resources: New Construction <b>(Mandatory)</b>	New Construction only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.1c	Smart Site Location - Proximity to Services: New Construction <b>(Mandatory)</b>	New Construction only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.2	Compact Development: New Construction <b>(Mandatory)</b>	New Construction only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.3	Walkable Neighborhoods: Sidewalks and Pathways <b>(Mandatory)</b>	The national criterion is modified by the Minnesota Overlay. The actual construction of sidewalks and pathways is waived for single-family rehabilitative activities.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4a	Smart Site Location: Passive Solar Heating/Cooling	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.4b	Smart Site Location: Grayfield, Brownfield or Adaptive Reuse Site	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.5	Compact Development	New Construction only	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.6	Walkable Neighborhoods: Connections to Surrounding Neighborhoods	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.7	Transportation Choices	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Section 3: Site Improvements</b>					
3.1	Environmental Remediation <b>(Mandatory)</b>	The national criterion for 3.1 is modified by the Minnesota Overlay. A Phase 1 must be completed <b>only</b> if the well is not connected to a city water supply OR if there is <b>no existing active well</b> .	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Erosion and Sedimentation Control <b>(Mandatory)</b>	Follow the national criterion for Erosion and Sedimentation Control during construction.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3	Landscaping <b>(Mandatory)</b>	The national criterion for 3.3 is modified by the Minnesota Overlay so that <b>IF landscaping is provided</b> , the lender, a Landscape Architect, or Architect must provide a tree or plant list demonstrating compliance with landscaping requirements for native, non-invasive species (see web resources in Overlay).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4	Surface Water Management	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3.5	Storm Drain Labels	Optional	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Quick reference for SF Rehab items
- Always mandatory items in yellow
- Items mandatory if touched in blue
- Available on the web



# Intended Methods

## Response Examples

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- **Acceptable**: Will comply with 4.1a by specifying and installing 1.3 gpm toilet in both bathrooms & 2.0 gpm kitchen aerator. Other water fixtures not being replaced per Scope of Work.
- **Unacceptable**: Will comply with green criteria.
- **Acceptable**: Not applicable. All water fixtures are in sound working order & do not need replacement.
- **Unacceptable**: N/A

# Intended Methods Form

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- **Funding availability and disbursement**
  - » **CRV disbursement available after receipt of approved form**
- **File maintenance**
  - » **CRV – retain updated form in file**
  - » **NSP – retain initial and updated forms in property file**

# Waiver Policy

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- **Waivers should be exception, not rule**
  - » **If product is unavailable, costs are excessive, or compliance is infeasible, a review of alternative means to achieve intended outcomes is possible**
    - **Waiver requests due to costs require a cost-benefit analysis by the developer / administrator**
      - ▶ **Activity should be undertaken if payback is 10 years or less**



# Waiver Process

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- **Include waiver request in the Intended Methods form**
  - » **In CRV – at RFP application**
  - » **In NSP - during work-scope development or bidding, submit to NSP mailbox at: I need to get this from Ruth.**
- **If unforeseen, submit Green Waiver Request Form**
  - » [www.mnhousing.gov/idc/groups/homes/documents/webcontent/mhfa\\_009083.pdf](http://www.mnhousing.gov/idc/groups/homes/documents/webcontent/mhfa_009083.pdf)

# Project Close-Out & Evaluation

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- **Actual scope of work completed as indicated on the Intended Methods form**
- **Certification of compliance (Sect. 11)**
  - » **Signed by Lender/Developer and Contractor**
- **Required**
  - » **CRV – at unit close-out**
  - » **NSP—at property close-out, retained by Subrecipient**

# **Project Close-Out & Evaluation**

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- **Evaluation framework under development**
- **Effectiveness of green policy**
  - » **Energy efficiency**
  - » **Healthy homes**
- **Key evaluative data points may be required at the project-level**
- **Target implementation date**
  - » **Summer 2010**

# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Carol Dixon**
  - » **Minnesota Housing Community Development**

# **1.1 Green Development Plan**

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- **Always mandatory**
- **Requires gathering of development team, meetings, minutes, site plans, etc.**
- **Not considered practical for SF projects**

## **Overlay**

- **Satisfied by Intended Method of Satisfying Green Communities Criteria Form/Worksheet**
  - » **Reusable template from project to project**
  - » **Provides checklist to verify compliance**



## 2.3 Walkable Neighborhoods

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- **Always mandatory**
- **No site map mandated if project does not encompass subdivision**

### Overlay

- **Construction of sidewalks /pathways waived for SF rehab**

**Note: Repair of walkways/  
sidewalks an eligible activity if  
in substandard condition**



# **3.1 Environmental Remediation**

- **Conduct a Phase 1 to determine whether hazardous materials are onsite; not required for NSP**

## **Overlay**

**Phase 1 ONLY required if:**

- **Unit is not connected to either a city water supply or an existing active well**
- **If digging a new well Phase 1 is required**

## **3.2 Erosion & Sedimentation Control**

- **Implement EPA's Best Management Practices for Erosion & Sedimentation Control**
- **No Overlay**
- **Will only apply in rehab when there is significant work involving backfilling, grading, or other disturbances of soil**

**[http://www.epa.gov/npdes/pubs/chap03\\_conguide.pdf](http://www.epa.gov/npdes/pubs/chap03_conguide.pdf)**

## 3.3 Landscaping

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- **Mandatory if providing landscaping**
- **Commit to providing a tree/plant list certified by the landscape architect or architect**
- **New trees plants at least 50% native, 100% site & soil appropriate, & 100% non-invasive**

## 3.3 Landscaping

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### Overlay

- **Architect or landscape architect certification not required**
- **Create in accordance with resources such as:**

[www.extension.umn.edu/distribution/naturalresources/DD0486.html](http://www.extension.umn.edu/distribution/naturalresources/DD0486.html)

[files.dnr.state.mn.us/assistance/backyard/gardens/native\\_plant/nativelandscaping.pdf](http://files.dnr.state.mn.us/assistance/backyard/gardens/native_plant/nativelandscaping.pdf)

# 4.1b Water-Conserving Appliances & Fixtures

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- **Mandatory if enacted upon**
- **Specify fixtures at or below the gallons per minute (gpm) stated in the criteria**

## Overlay

- **If fixtures are leaky, defective, or scheduled for replacement, specify low-flow fixtures**

## 4.2 Efficient Irrigation

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- **Mandatory if irrigation is necessary**
- **Must be designed by EPA Water Sense certified or qualified landscape professional**

### Overlay

- **Must be designed by professional as above or qualified sprinkler contractor**





# Q & A

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- **We will take time here to answer a few questions.**



# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**

## 5.1b Efficient Energy Use

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- **Always mandatory under CRV; not required for NSP**
- **Identify architect/engineer/energy auditor**
- **Prepare energy efficiency improvements report with recommendations to achieve 15% reduction in energy performance**

### Overlay

- **Create/implement energy efficiency improvement plan in accordance with technical guidelines of the Minnesota Weatherization Field Guide (Chap. 2.1.1)**

[http://www.state.mn.us/mn/externalDocs/Commerce/070704030802\\_Minnnesota%20WFG.pdf](http://www.state.mn.us/mn/externalDocs/Commerce/070704030802_Minnnesota%20WFG.pdf)

## 5.1b Efficient Energy Use (cont.)

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- Requires compliant energy audit including info collection, dwelling evaluation, & dwelling strategy
- Initial blower door test
- Implement list of cost effective improvements (*Savings to Investment Ratio*)
- Post-inspection and blower door test performed
- If replacing heating, cooling, ventilation or hot water, install Energy Star rated mechanical systems

# 5.1b Efficient Energy Use (cont.)

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- **To find an auditor:**
  - » **CAP agencies**
  - » **Local utilities**
  - » **Trained auditors:**  
[www.dunwoody.edu/custom/energyaudit.html#jobs](http://www.dunwoody.edu/custom/energyaudit.html#jobs)
  - » **HERS raters:** [www.mbpa.us](http://www.mbpa.us)



## **5.1b Efficient Energy Use (cont.)**

- **Calculating the cost benefit analysis:**
  - » **Software – Savings to Investment Ratio (SIR)**
    - **National: Weatherization Assistant (software), utilizes the National Energy Audit Tool (NEAT), and Manufactured Home Energy Audit (MHEA)**
    - **Minnesota Weatherization software will be available to non-CAP agencies**
      - ▶ **Survey questions**
  - » **Manual**

## 5.2 Energy Star Appliances

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- **Mandatory if providing appliances**



# 5.3a Efficient Lighting

## Interior

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- **Mandatory if light fixtures are in need or repair, are unsafe or inefficient, or otherwise scheduled for replacement**
- **Install the Energy Star Advanced Lighting Package (intended for new construction)**
- **Install CFLs if reusing existing fixtures**
- **If installing new, use Energy Star-labeled**

# **5.3b Efficient Lighting**

## **Exterior**

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- **Mandatory if exterior light fixtures are added or replaced**
- **Fixture must feature daylight sensors or timers**
- **Applies to all outdoor lighting attached to the home, including front and rear porch lights**
- **Recommended upgrade even if light fixtures not schedule for replacement**

# 5.4 Electricity Meter

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- **Mandatory if an electricity meter is to be installed or replaced**
- **Must be individual or sub-metered electric meters**



# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Carol Dixon**
  - » **Minnesota Housing Community Development**

# 7.1 Low/No VOC Paints & Primers

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- **Mandatory if paints or primers are to be used**
- **Specify that all paints and primers comply with current Green Seal standards for VOCs**
- **Green Seal website has a ‘find a product’ feature**

<http://www.greenseal.org/certification/standards/gs11paintscoatings.cfm>

## 7.2 Low/No VOC Adhesives and Sealants

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- **Mandatory if using adhesives or sealants**
- **Specify they comply with South Coast Air Quality Management District Rule 1168 (see pages 10-12 of PDF document below)**

### Overlay

- **Waived if use of such adhesive or sealant will invalidate the warranty of an associated product**

**<http://www.aqmd.gov/rules/reg/reg11/r1168.pdf>**

# 7.3 Urea Formaldehyde-Free Composite Wood

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- **Particleboard & medium-density fiberboard must be compliant with The American National Standard for Particleboard, ANSI A208.1**
- **Limit of .30 parts per million (ppm) for industrial particleboard, .20 ppm in particleboard flooring, & .30 ppm for MDF**
- **Easiest compliance is to specify urea formaldehyde-free**
- **If using composite wood that is not ANSI-compliant, all exposed edges & sides must be sealed with low-VOC sealants**

<http://www.fpl.fs.fed.us/documnts/fplgtr/fplgtr53.pdf>

<http://www.pbmdf.com/index.asp?bid=1142>

## 7.4 Green Label Certified Floor Coverings

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- **Use non-carpet alternatives below grade, in entries, laundry rooms, bathrooms, kitchens, and utility rooms (use smooth & resilient flooring that tolerates moisture)**
- **Consider non-carpet alternatives throughout the home**



## 7.4 Green Label Certified Floor Coverings

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- If carpeting , use low VOC carpet, padding, & adhesives certified by Carpet & Rug Institute's Green Label Program (all major manufacturers—Shaw, Mohawk, etc. make carpet meeting this criteria)

<http://www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/> (see product search feature at right)

## 7.5a Exhaust Fans—Bathroom

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- **If installing or replacing an exhaust fan, specify that it is Energy Star-labeled**
- **Continuous operation, or connected to a light switch and featuring a humidistat or timer**

### Overlay

- **Can just be connected in on/off fashion to light switch, though continuous, humidistat or timer are preferred**

**[http://www.energystar.gov/index.cfm?c=vent\\_fans.pr\\_vent\\_fans](http://www.energystar.gov/index.cfm?c=vent_fans.pr_vent_fans)**

## 7.5b Exhaust Fans—Kitchen

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- **If installing or replacing a kitchen exhaust fan, specify power vented fan or range hood**
- **Consider Energy Star-qualified fans, timers, or humidistat**

### Overlay

- **Kitchen fan may be non-ducted only if it is infeasible to install duct and there is a continuous operation bathroom fan**



[http://www.energystar.gov/index.cfm?c=vent\\_fans.pr\\_vent\\_fans](http://www.energystar.gov/index.cfm?c=vent_fans.pr_vent_fans)

# 7.6a Ventilation

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- **If installation of a ventilation system is needed, comply with ASHRAE 62.2**

## **Overlay**

- **If ventilation system in compliance with MN Energy Code 1322, criteria is met**
- **Bottom line: consider interaction between energy efficiency improvements & exhaust & ventilation. If making adjustments to ventilation system, work must be code compliant and verified by inspector as such**
- **[http://www.dli.mn.gov/ccld/pdf/sbc\\_1322.pdf](http://www.dli.mn.gov/ccld/pdf/sbc_1322.pdf)**

## 7.7 HVAC Sizing

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- **If installing new heating or cooling equipment, specify the contractor “right size” it in accordance with ACCA Manual Parts J (load calculation) & S (equipment selection)**
- **Or, use ASHRAE handbooks or equivalent software**

<http://www.energy.ca.gov/efficiency/qualityhomes/procedures.html>

# 7.8 Water Heaters

## Mold Prevention

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- **If water heater needs to be replaced, specify tankless hot water heaters**
- **If not tankless, install conventional heater in room with non-water sensitive floor and drain or catch pan piped to exterior**
- **Drain pans should be corrosion resistant and sloped, and condensate lines should be drained to drainage system not deposited under slab**

# 7.9a Materials in Wet Areas

## Surfaces

- **Smooth, durable, & cleanable**
- **Avoid mold-propagating materials such as vinyl wallpaper or unsealed grout**





# 7.9b Materials in Wet Areas

## Tub & Shower

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- **Fiberglass enclosure or similar**
- **Use backing materials such as cement board, fiber cement board, or equivalent**



# Q & A

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- **We will take time here to answer a few questions.**



# Next Speaker

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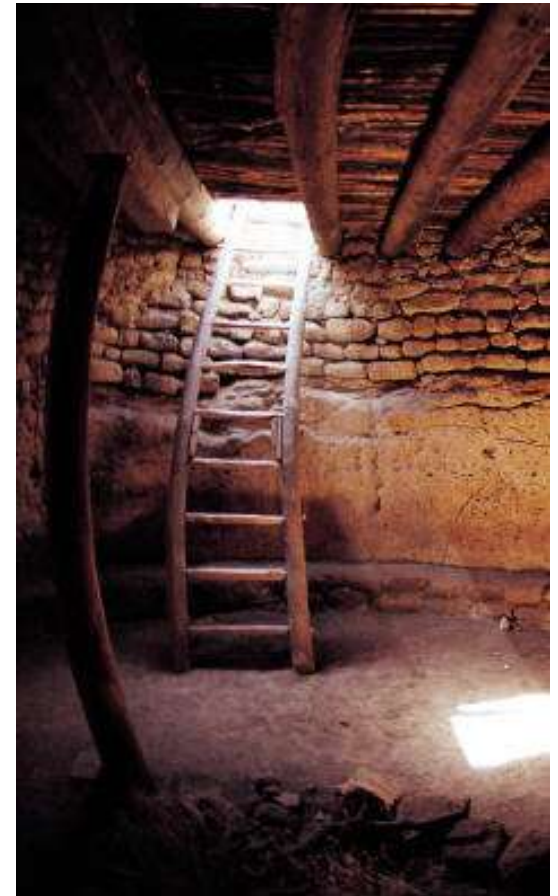
- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**

# 7.10b Basements/Concrete Slab Radon

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- Covers 7.10a (vapor barrier)
- **Radon testing required under CRV; not required for NSP**
- If radon higher than 4 pCi/l, must install active mitigation features and conduct a post-test
- Find service provider & more information on Minnesota Department of Health website:

<http://www.health.state.mn.us/divs/eh/indoorair/radon/index.html>



# 7.10b Basements/Concrete Slab

## Radon

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- **Radon Mitigation Funds Available**
  - » **Up to \$500 for the cost of materials for units that test above 4.0 pCi/L**
  - » **MDH test kits required for pre-testing (2) and post-testing (1)**
  - » **Reservation and disbursement request form**  
**[www.mnhousing.gov/idc/groups/homes/documents/webcontent/mhfa\\_009281.pdf](http://www.mnhousing.gov/idc/groups/homes/documents/webcontent/mhfa_009281.pdf)**
  - » **Funds available for first 20 homes**
  - » **Free MDH test kits available**

# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Andrew Gilbert**
  - » **Indoor Air Unit, Minnesota Department of Health**
  - » **651.201.4604 or**  
**[andrew.gilbert@state.mn.us](mailto:andrew.gilbert@state.mn.us)**

# **Radon: Health Risks and What You Can Do**

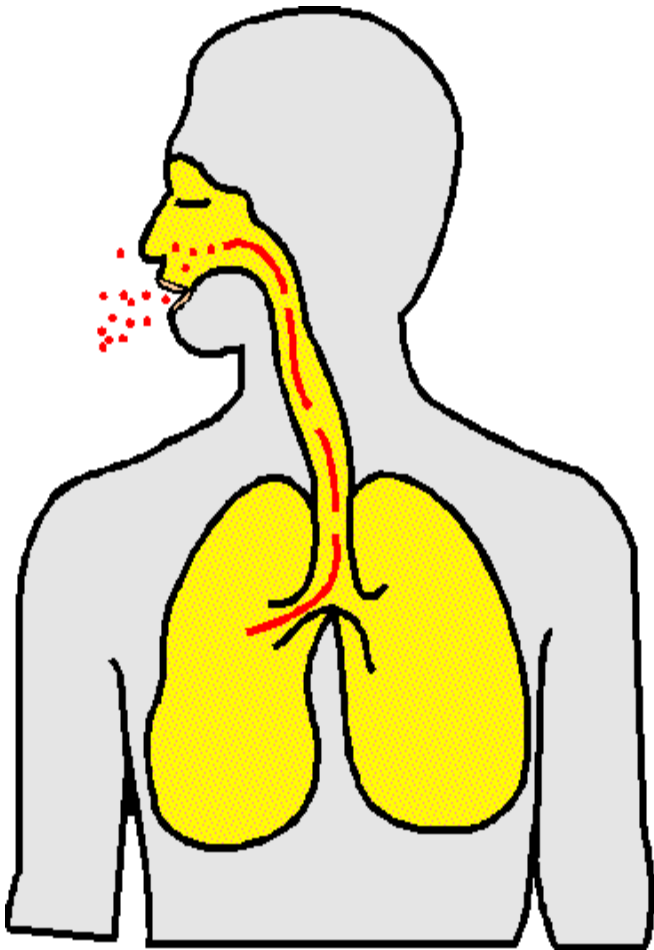
**Andrew Gilbert**

**Indoor Air Unit, Environmental Health Division**

**Minnesota Department of Health**

# Radon is a Lung Cancer Causing Gas

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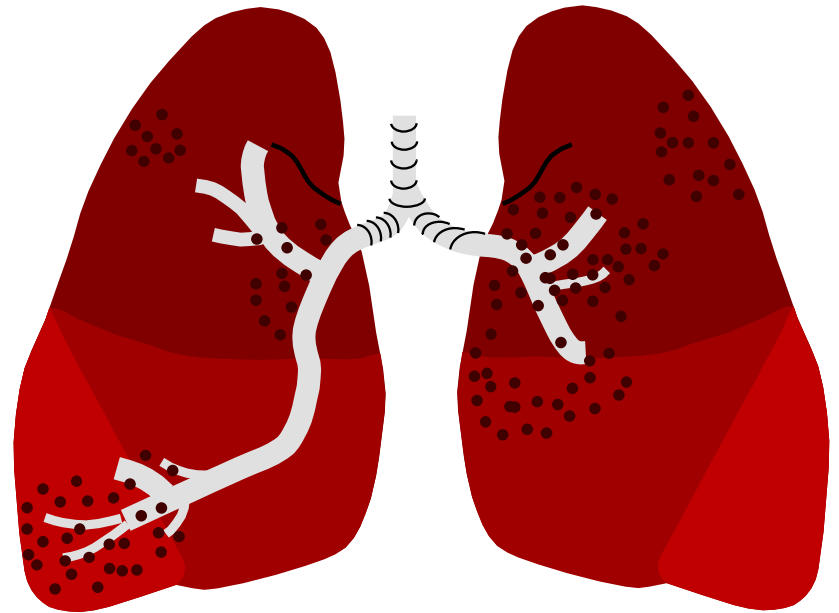


- **Radon decays into radioactive alpha particles**
- **These particles are inhaled and deposited in the lungs**
- **Irradiate lungs**
- **Causing physical and chemical damage to DNA, increasing the potential for cancer**

# Health Effects Of Radon

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- **Second leading cause of lung cancer in the United States**
  - » **Estimated to cause 21,000 deaths annually\***
  - » **Second only to smoking**
- **Leading cause of lung cancer for non-smokers**





# **Lung Cancer in Minnesota**

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- **Lung and bronchus cancer is the second most commonly diagnosed cancer in Minnesota**
- **Leading cause of cancer death**
- **Each year, 2,700 cases diagnosed in MN and 2,230 deaths occur**
- **About 90 percent of cases are diagnosed between 50 and 85 years of age**
- **\* Cancer in Minnesota, 1988-2002, Minnesota Department of Health, MN Cancer Surveillance System**

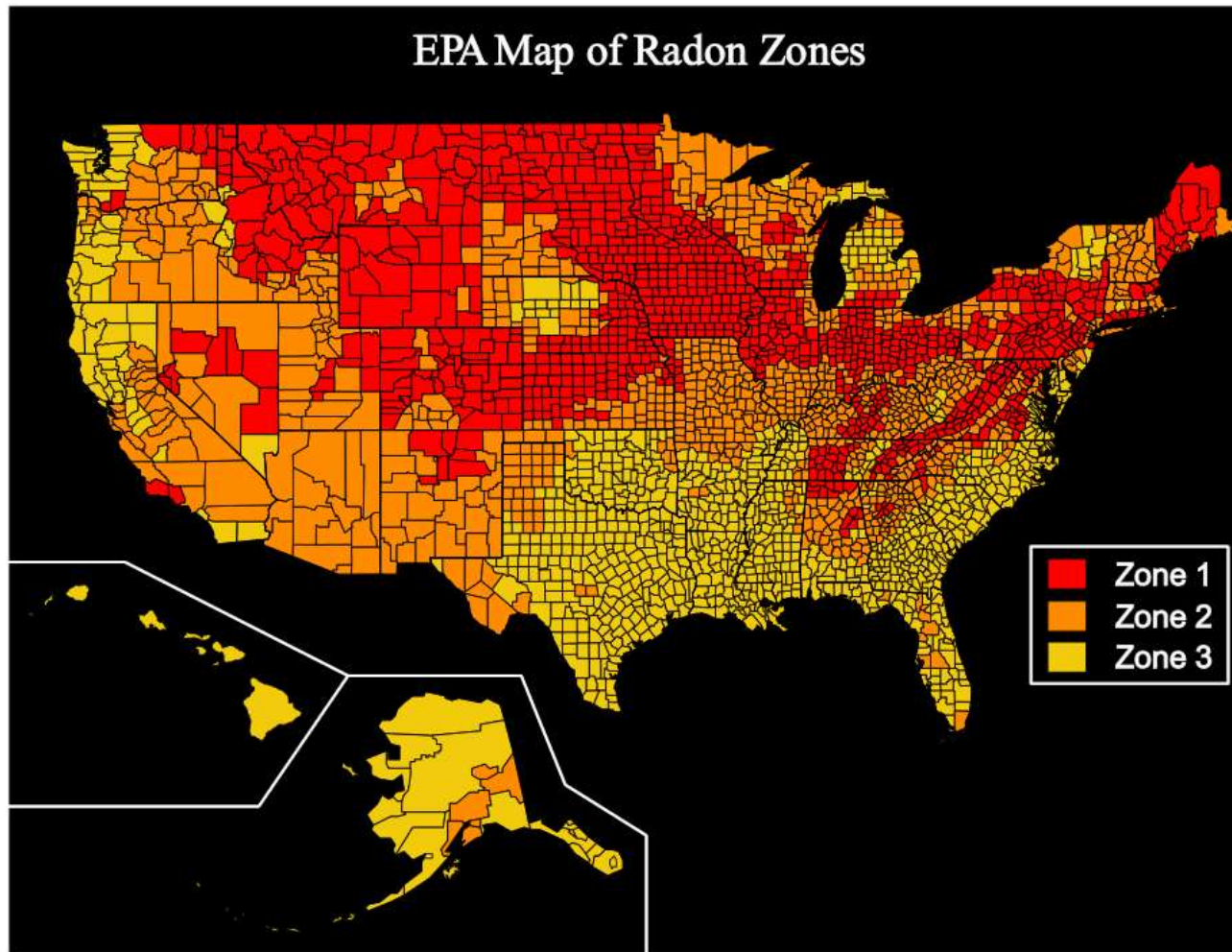
# What Level of Radon is Considered Safe?

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- **There is no known safe level of radon**
- **EPA recommends that all homes with radon levels of 4 pCi/L or more be mitigated**
  - » **Not a health based standard**
  - » **Based on mitigation technology**

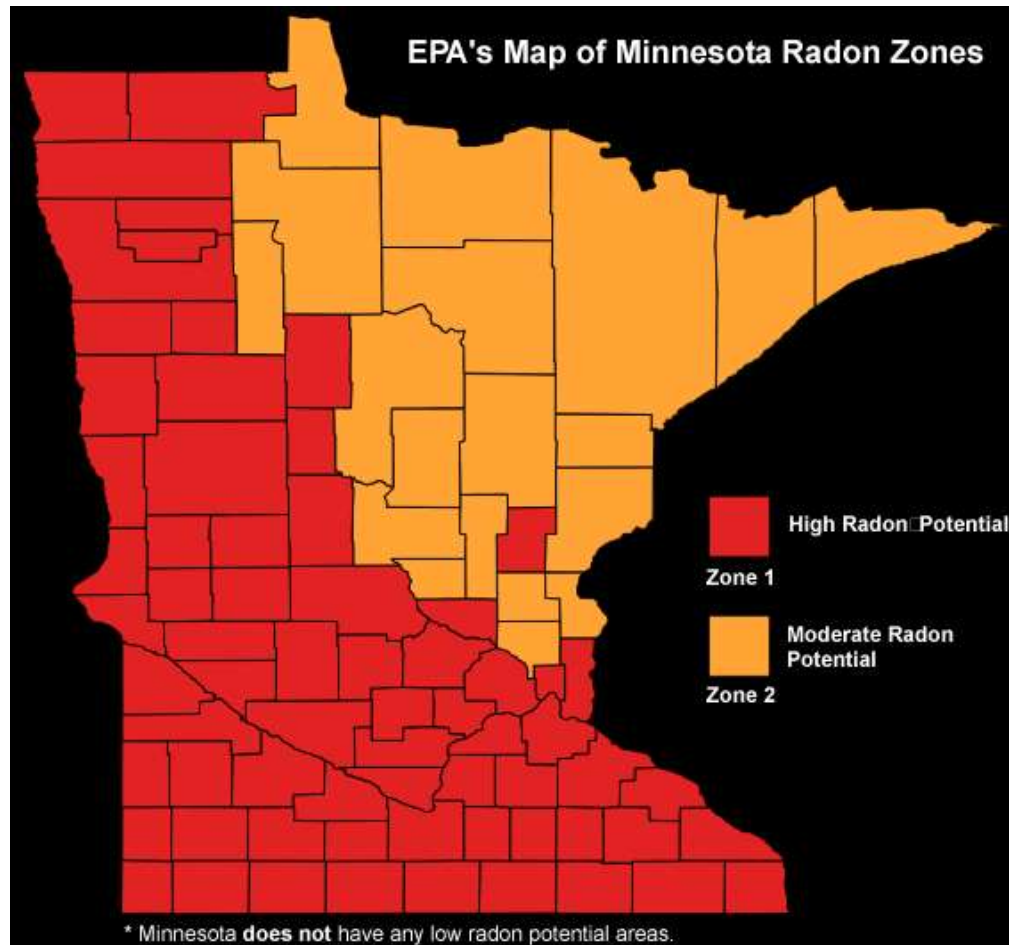
# Radon in the United States

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# Many Minnesota homes have high levels of radon

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# **How Are Radon Levels Measured?**

- **picoCuries/liter of air (pCi/L)**
  - » **A pCi/L is equal to 2.22 radioactive disintegrations per minute per liter of air**
- **EPA's Action Level is 4.0 pCi/L**
  - » **There is no safe level of radon**

# **Chances Of Developing Cancer Due To Radon Depend On:**

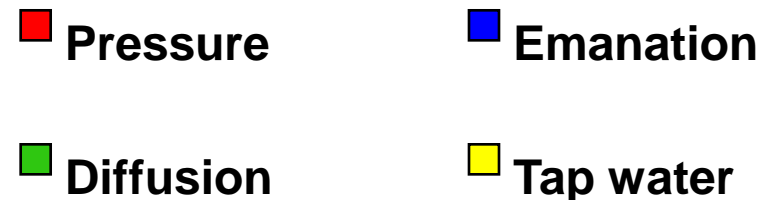
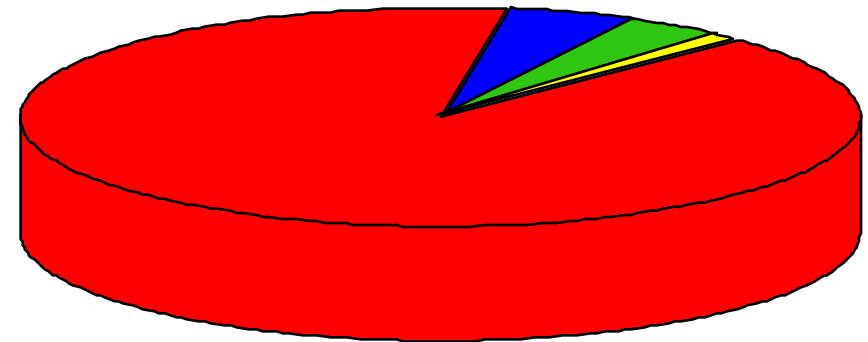
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- **The levels of radon in the home**
- **The amount of time spent in the home**
- **Whether or not a person is, or ever was a smoker**

# Contributions To Indoor Radon Levels

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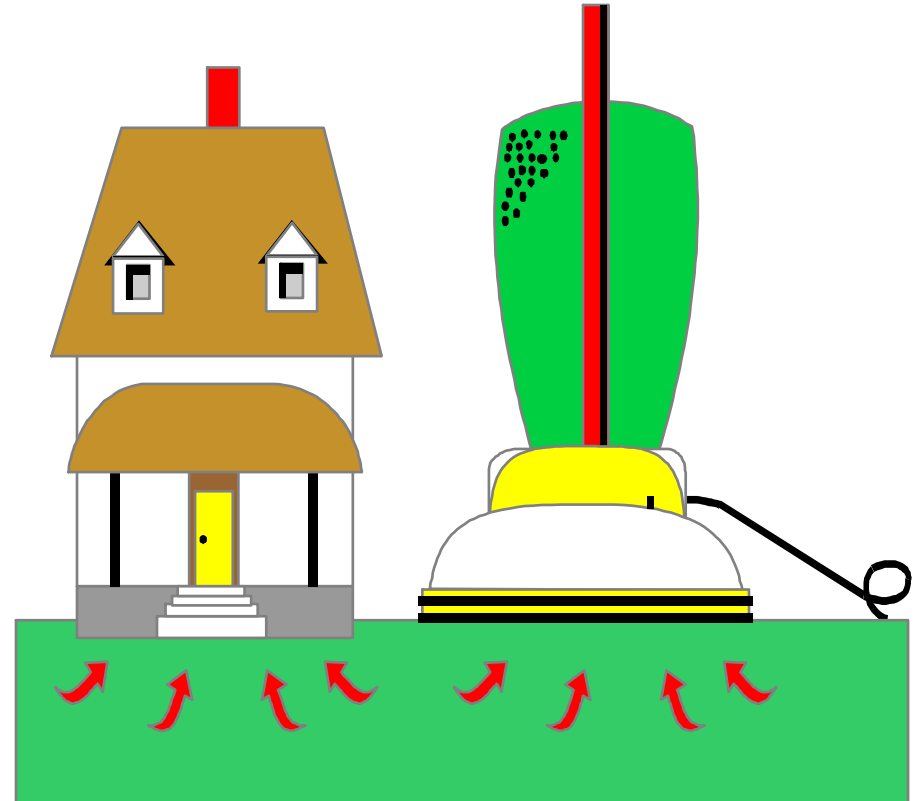
- **Pressure driven soil gas**
  - » **85-90%**
- **Emanation from building materials**
  - » **2-5%**
- **Diffusion from soil**
  - » **1-4%**
- **Tap water**
  - » **<1%**



# The Predominant Driving Force is Building Induced Soil Suction

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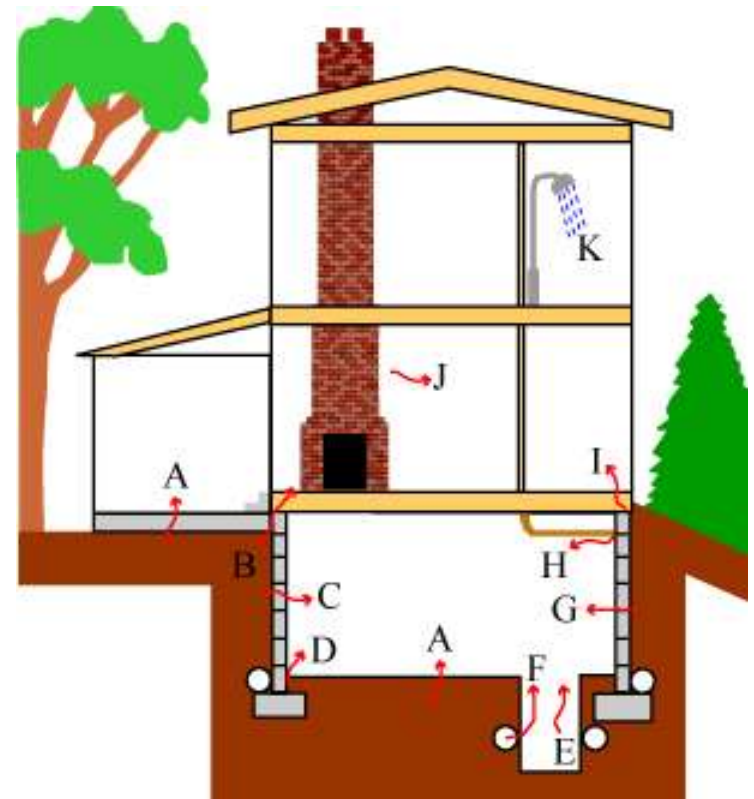
- **Buildings create vacuums that draw in soil gas.**
- **These vacuums may be very small and are referred to as air pressure differentials.**





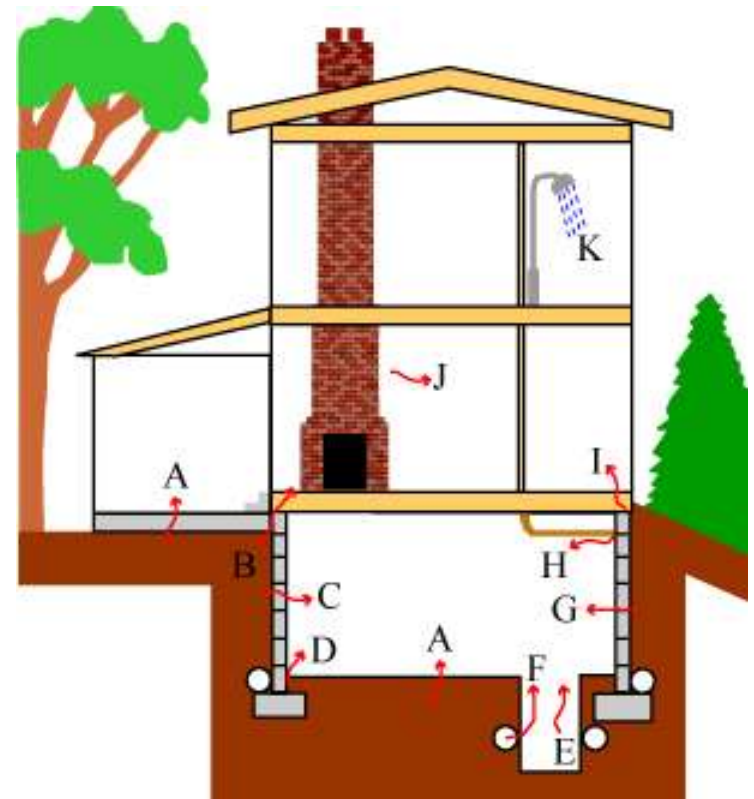
# How Does Radon Get Into Your Home?

- **Cracks in concrete slabs**
- **Spaces behind brick veneer walls that rest on uncapped hollow-block foundations**
- **Pores and cracks in concrete blocks**
- **Floor-wall joints (cold joints)**
- **Exposed soil, as in a sump or crawl space**



# How Does Radon Get Into Your Home?

- **Weeping (drain) tile, if drained to an open sump**
- **Mortar joints**
- **Loose fitting pipe penetrations**
- **Open tops of block walls**
- **Building materials, such as brick, concrete, rock**
- **Well water (not commonly a major source in Minnesota homes)**



# Testing For Radon

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- **Every home should be tested**
- **It's easy**
  - » **Takes no special skills**
  - » **Only takes a couple of minutes of your time**
- **It's inexpensive**
  - » **Most radon detector kits cost under \$20**
    - **Contact local city or county health departments for discounted test kits**
    - **Or order from [www.mn.radon.com](http://www.mn.radon.com)**

# Where Should A Test Be Conducted?

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- **On the lowest “lived-in level”**
- **NOT in kitchens or bathrooms**
  - » **high humidity**
- **Away from drafts and high heat**
  - » **appliances**
  - » **fireplaces**
  - » **direct sunlight**
- **At least 3 feet (90 cm) from windows and doors**
- **At least 1 foot (30 cm) from exterior walls**
- **At least 20 inches (50 cm) off the floor**

# What To Do If You Test And Get A High Result

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- **Retest to confirm the results**
  - » in the same location as the first test (or with simultaneous testing)
- **Mitigate the home if the retest confirms high levels of radon (above 4 pCi/L)**
- **Contact a National Environmental Health Association (NEHA) or National Radon Safety Board (NRSB) listed Radon Contractor (Mitigation Professional)**
- **MDH has a list of Minnesota Radon Mitigation Service Providers**

<http://www.health.state.mn.us/divs/eh/indoorair/radon/mitigation.html>

# Major Entry Points and Fixes

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**Un-Sealed Sump Basket**



**Foundation Cold Joint**

# **How Do You Mitigate? (Depressurization)**

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- **Ventilate**
  - » **Sub-Slab Depressurization**
  - » **Drain Tile Depressurization**
  - » **Sump Pit Depressurization**
  - » **Contact a NEHA or NRSB certified radon contractor**

# Sub-slab Depressurization

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- Pipes are inserted through the basement floor
- The pipe is run through the roof





# Drain Tile Depressurization

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- **A PVC pipe is hooked up to an existing drain tile under the foundation of the home.**



# Sump Pit Depressurization

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- **A PVC pipe is installed into the sump basket**



# Fan (active Vs. passive)

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**The fan draws soil gases into the pipe and vents them to the outdoor air**



# Post-mitigation Procedures

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- **After you mitigate, test the home to determine if the mitigation is working (24 hours to 30 days after mitigation)**
- **Homeowners should retest home once every 2 years or so**
- **If you do any remodeling, or change how the house operates, you should retest after the alteration of the building**

# Radon Information

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- **Local Health Department - Contacts:**

<http://www.health.state.mn.us/radon>

- **American Lung Association**

[www.alamn.org](http://www.alamn.org)

- **Air Chek Radon Labs**

[www.mn.radon.com](http://www.mn.radon.com) or 800-247-2435

# Contacts For More Information

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- **Andrew Gilbert**
- **MDH - Indoor Air Unit**    [www.health.state.mn.us](http://www.health.state.mn.us)  
**P0 Box 64975**  
**St. Paul, MN 55164-0975**  
[Andrew.Gilbert@state.mn.us](mailto:Andrew.Gilbert@state.mn.us)  
**651-201-4604**
- **U.S. Environmental Protection Agency**  
» <http://www.epa.gov/radon/>

# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**

# 7.11 Water Drainage

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- **If water drainage mitigation is needed:**
  - » **Drain to the lowest level of concrete away from windows, walls and foundation using techniques identified in the National Green Communities Criteria**



## 7.12 Garage Isolation

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- **Must comply with 2006 legislative CO requirements**
- **If rehabilitation requires pulling a permit this requirement is triggered, and CO detector must be placed within 10 feet of all rooms used as sleeping quarters**
- **Can be hardwired, plugged into electrical outlet, or battery operated & installed on a wall**

## 7.13 Clothes Dryer Exhaust

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- **If working with a dryer vent, specify rigid type & exhaust to outdoors**
- **If non-rigid exhaust vent in place, it is still recommended for replacement**



# **7.14 Integrated Pest Management**

- **Seal accessible wall, floor, & joint penetrations**
- **Use low-VOC caulk**
- **Install rodent & corrosion-free screens for any large openings**



# 7.15 Lead-Safe Work Practices

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- **Lead safe work practices**
  - » **CRV: comply with Agency lead policy**
    - **modified 24 CFR part 35 to exclude abatement (highest treatment level is interim controls)**
  - » **NSP – follow 24 CFR part 35**

# 7.18 Combustion Equipment

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- **Specify power vented or combustion sealed equipment**
- **Ensure CO detection is in compliance with MN 2006 legislative requirements**



## 8.2 Occupant's Manual

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- **Required for CRV; not required for NSP**
- **Satisfies criterion 8.1**
- **Explains green features of the home**
- **Encourages energy and resource efficient behavior by inhabitants**
- **Resources coming soon!**

# 8.3 Homeowner and Resident Orientation

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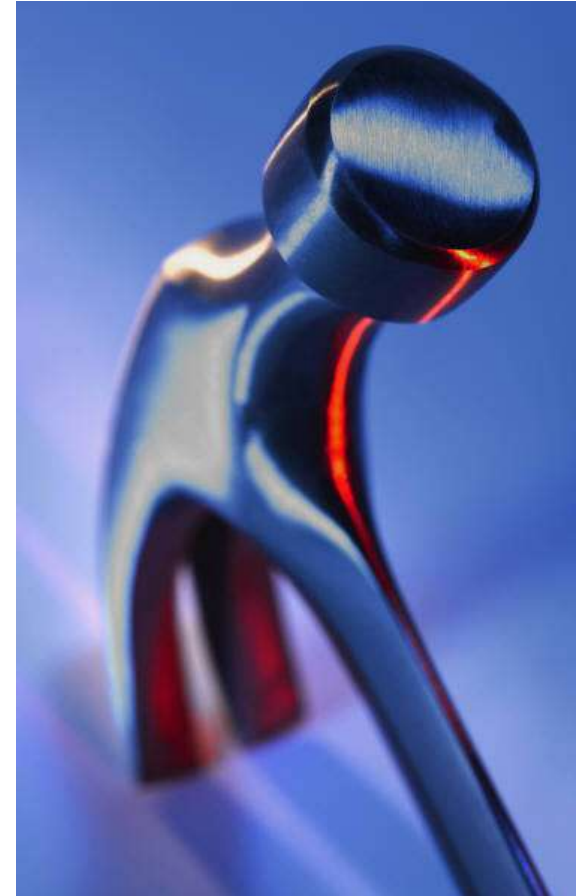


- **Required for CRV; not required for NSP**
- **Provide a homeowner orientation to review:**
  - » **Green features**
  - » **Operations and maintenance**

# Tools & Resources

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- **Review National Green Communities Criteria and the MN Overlay**
- **Review reference materials**
- **Update specs with mandatory green requirements and additional green elements**
- **Complete Intended Methods form**





# Tools & References

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- **MN Green Communities**
  - » [www.mngreencommunities.org](http://www.mngreencommunities.org)
- **Center for Sustainable Building Research**
  - » [www.csbr.umn.edu](http://www.csbr.umn.edu)
- **Green specs (specific to MN Green Communities)**
  - » [www.mngreencommunities.org/publications/download/Specifications-for-Housing-Rehabilitation.doc](http://www.mngreencommunities.org/publications/download/Specifications-for-Housing-Rehabilitation.doc)
- **Enterprise Green Communities**
  - » [www.greencommunitiesonline.org](http://www.greencommunitiesonline.org)

# Q & A

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- **We will take time here to answer a few questions.**



# For More Information Contact

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## CRV

- **Terry Hanna**
  - » **651.296.9567** or [terry.hanna@state.mn.us](mailto:terry.hanna@state.mn.us)
- **Nancy Slattsveen**
  - » **651.296.7994** or [nancy.slattsveen@state.mn.us](mailto:nancy.slattsveen@state.mn.us)
- **Devon Pohlman**
  - » **651.296.8255** or [devon.pohlman@state.mn.us](mailto:devon.pohlman@state.mn.us)

## NSP

- **Carol Dixon**
  - » **651.296.0756** or [carol.dixon@state.mn.us](mailto:carol.dixon@state.mn.us)



# Next Speaker

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- **Please hold as we transition to the next speaker**
- **John Harrington**
  - » **Greater MN Housing Fund**

# **Greater Minnesota Housing Fund**

Interim Funding Options  
for Greening Projects



# Interim Loans

- **Predevelopment Loans**
  - To plan and design, package financing, and manage development.
- **Acquisition Loans**
  - To purchase land or buildings. Priority given to preservation projects with expiring federal or state subsidies.
- **Low Income Tax Credit Bridge Loans**
  - Interim financing when permanent financing has already been committed.
- **Construction Loans**
  - Construction financing to support the production of affordable starter homes.
- **Foreclosure Recovery Loans**
  - Low-interest financing to purchase and rehabilitate foreclosed, vacant and abandoned properties



# Eligible Projects

- New construction, acquisition/rehabilitation
- Homeownership (limited to 80% of statewide median income)
- Multifamily rental and permanent supportive housing (limited to 60% of statewide median income)



# Eligible Borrowers

- Non-Profit Developers
- For-Profit Developers
- Public Agency Developers





# On-line Application

- <http://www.gmhf.com/lending/forms/interim-loan-app.pdf>



# Green Predevelopment Technical Assistance Resources

- Enterprise list of approved local Technical Assistance providers.
- Enterprise list of approved local charrette facilitators.
- **Limited** technical assistance continues to be available from GMHF staff



# Green Predevelopment Technical Assistance Resources

- Minnesota Green Communities  
green single family rehab specifications.  
[www.mnngreencommunities.org/publications/](http://www.mnngreencommunities.org/publications/)
- Enterprise charrette information  
[www.greencommunitiesonline.org/tools/funding/grants/charrette.asp](http://www.greencommunitiesonline.org/tools/funding/grants/charrette.asp)
- Green Communities Technical Assistance  
information  
[www.mnngreencommunities.org/](http://www.mnngreencommunities.org/)



# Green Predevelopment Financial Resources

- Enterprise \$5,000 grants for green charrettes.
- GMHF Predevelopment Loans can cover charrette costs if no grant.
- GMHF will require charrette if Predevelopment Loan awarded and assistance needed



# Next Speaker

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- **Please hold as we transition to the next speaker**
- **Devon Pohlman**
  - » **Minnesota Housing Single Family Programs**

# Thank You!

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